

REMARKS

Claims 1-15, 17-21, and 23-24 are all the claims presently pending in the application. Claims 1, 5, 9, 17-19, and 23-24 are amended to more clearly define the invention and claims 16 and 22 are canceled. Claims 1, 4-5, 8-9, 12, and 19 are independent.

These amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability.

Applicants also note that, notwithstanding any claim amendments herein or later during prosecution, Applicants' intent is to encompass equivalents of all claim elements.

Applicants gratefully acknowledge the Examiner's indication that claims 4, 8, and 12 are allowed. However, Applicants respectfully submit that all of the claims are allowable.

Applicants gratefully acknowledge the Examiner's indication that claims 2-3, 6-7, 10-11, 16-18, and 22-24 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, Applicants respectfully submit that all of the claims are allowable.

Claims 1, 5, 9, 13-15, and 19-21 stand rejected under 35 U.S.C. § 102(b) as being anticipated by the Migita reference. Claims 1, 5, 9, and 19-21 stand rejected under 35 U.S.C. § 102(e) as being anticipated by the Inoue et al. reference.

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

An exemplary embodiment of the claimed invention, as defined by, for example, independent claim 1, is directed to a power-saving task processing system that includes a

remaining power detector for detecting a remaining power of a battery. The remaining power detector outputs a detection result about a value or state of the remaining power of the battery. The system further includes a motion information-storage for storing a motion information table. The motion information table defines a relationship between values or states of the remaining power of the battery on execution of a task and a plurality of processes for each task. Each of the plurality of processes corresponds to a different value or state of the remaining power of the battery and for which complete execution is ensured at the respective values or states of the remaining power of the battery. The system further includes a task controller for controlling execution of tasks to be executed. When the task controller executes a task, the task controller chooses and executes one of the plurality of processes from the motion information table according to the detection result of the remaining power detector. The motion information table also includes a repetition frequency for each of the plurality of processes.

Conventional battery powered robots are required to complete an assigned (instructed) task. However, these conventional robots may not be able to complete an assigned task because the remaining amount of battery power is insufficient to complete the assigned task.

If one of these conventional battery powered robots is unable to complete an assigned task, a serious malfunction may be caused. For example, incomplete execution of a task may lead to a halt of a manufacturing line and/or generation of defective products.

To address this problem, some conventional battery powered robots determine the amount of remaining battery power and then determine whether sufficient battery power remains for an instructed task. If there is insufficient battery power, these conventional robots do not execute the instructed task.

Further, these conventional battery powered robots may suddenly stop executing a series of tasks if there is not enough battery power to complete any one of the tasks. Thus, the remaining battery power is not efficiently used.

In stark contrast to these conventional systems, the present invention provides a power-saving task processing system that provides a motion information table having repetition frequency for each of the plurality of processes. In this manner, a task controller may select from a plurality of processes and repetition frequencies for an assigned task based upon the amount of remaining battery power and, therefore, avoid sudden stops of execution of tasks, allow a user to feel continuous operation of a battery-powered apparatus (e.g., a robot) without inducing a feeling of wrongness in the user, extend the actual useable or available period that the battery-powered apparatus is available for completing tasks between charging, and reduce the amount of power that is consumed for a given number of executed tasks. (Page 6, line 22 - page 7, line 20).

II. THE PRIOR ART REJECTIONS

A. The Migita reference

The Examiner alleges that the Migita reference teaches the claimed invention. Applicants submit, however, that there are elements of the claimed invention which are neither taught nor suggested by the Migita reference.

None of the applied references teaches or suggests the features of the claimed invention including a power-saving task processing system that includes a motion information table having a repetition frequency for each of the plurality of processes. As explained above, this feature is important for selecting from a plurality of processes and

repetition frequencies for an assigned task based upon the amount of remaining battery power and, therefore, avoiding sudden stops of execution of tasks, allowing a user to feel continuous operation of a battery-powered apparatus (e.g., a robot) without inducing a feeling of wrongness in the user, extending the actual useable or available period that the battery-powered apparatus is available for completing tasks between charging, and reducing the amount of power that is consumed for a given number of executed tasks.

Applicants note that the Migita reference appears to disclose controlling the stage of a system terminating process based upon the amount of remaining battery power. In other words, the Migita reference discloses determining which of a particular set of tasks are executed as the power of a battery powering a system is reduced. The Migita reference clearly does not teach or suggest a motion information table that includes a plurality of processes for each task, let alone a relationship between the plurality of processes for each task and the remaining power of a battery.

Rather, the Migita reference merely discloses selecting between tasks in accordance with remaining battery power and does not teach or suggest any relationship between a remaining battery power and a plurality of processes for a task.

Indeed, the Migita reference is only relevant to an orderly shut down of a computer and has absolutely nothing to do with motion as recited by the independent claims.

Further, the Migita reference does not teach or suggest a power-saving task processing system that includes a motion information table having a repetition frequency for each of the plurality of processes.

Indeed, the Examiner does not allege that the Migita reference discloses this feature.

Therefore, the Migita reference does not teach or suggest each and every element of

the claimed invention and the Examiner is respectfully requested to withdraw this rejection.

B. The Inoue et al. reference

The Examiner alleges that the Inoue et al. reference teaches the claimed invention. Applicants submit, however, that there are elements of the claimed invention which are neither taught nor suggested by the Inoue et al. reference.

None of the applied references teaches or suggests the features of the claimed invention including a power-saving task processing system that includes a motion information table having a repetition frequency for each of the plurality of processes. As explained above, this feature is important for selecting from a plurality of processes and repetition frequencies for an assigned task based upon the amount of remaining battery power and, therefore, avoiding sudden stops of execution of tasks, allowing a user to feel continuous operation of a battery-powered apparatus (e.g., a robot) without inducing a feeling of wrongness in the user, extending the actual useable or available period that the battery-powered apparatus is available for completing tasks between charging, and reducing the amount of power that is consumed for a given number of executed tasks.

Applicants note that the Inoue et al. reference appears to disclose determining a remaining battery power and adjusting the “appetite” of the unit which in turn affects the intensity of the motions performed by the unit (col. 14, lines 41-62) and reducing the amount of movement to perform a particular task based upon the remaining battery power (col. 17, lines 9-16).

However, the Inoue et al. reference does not teach or suggest a power-saving task processing system that includes a motion information table having a repetition frequency for

each of the plurality of processes.

Indeed, the Examiner does not allege that the Inoue et al. reference discloses this feature.

Therefore, the Inoue et al. reference does not teach or suggest each and every element of the claimed invention and the Examiner is respectfully requested to withdraw this rejection.

III. FORMAL MATTERS AND CONCLUSION


In view of the foregoing amendments and remarks, Applicants respectfully submit that claims 1-15, 17-21, and 23-24, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 10/27/15


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